

Noble Energy

CO, Weld County (NAD 83 NZ)
Sec 10 Twn 02 N Rng 64 W
Oscar Y11-79HN ST01
05-123-37943
H&P 277



A Schlumberger Company

Final Survey Report

7-Jan-2015

Well Coordinates:	NAD83 Colorado State Plane, NZ, US Feet
	N 40° 9' 7.99200" W 104° 31' 51.27600"
	1299777.27 usFt 3270882.66 usFt
Ground Level:	4929.00 ft MSL
TVD Reference:	le: RKB @ 4953.00 ft MSL
Local Coordinate Origin:	Oscar Y11-79HN well head
Vertical Section Azimuth:	3.682 ° (Grid North)
North Reference:	Grid North

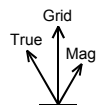
DOX Version: 2.8

Borehole:	Well:	Field:	Structure:
ST01	Oscar Y11-79HN	CO, Weld County (NAD 83 NZ)	Noble 10-02N-64W (Oscar Y10-73HN Pad) - H&P 277

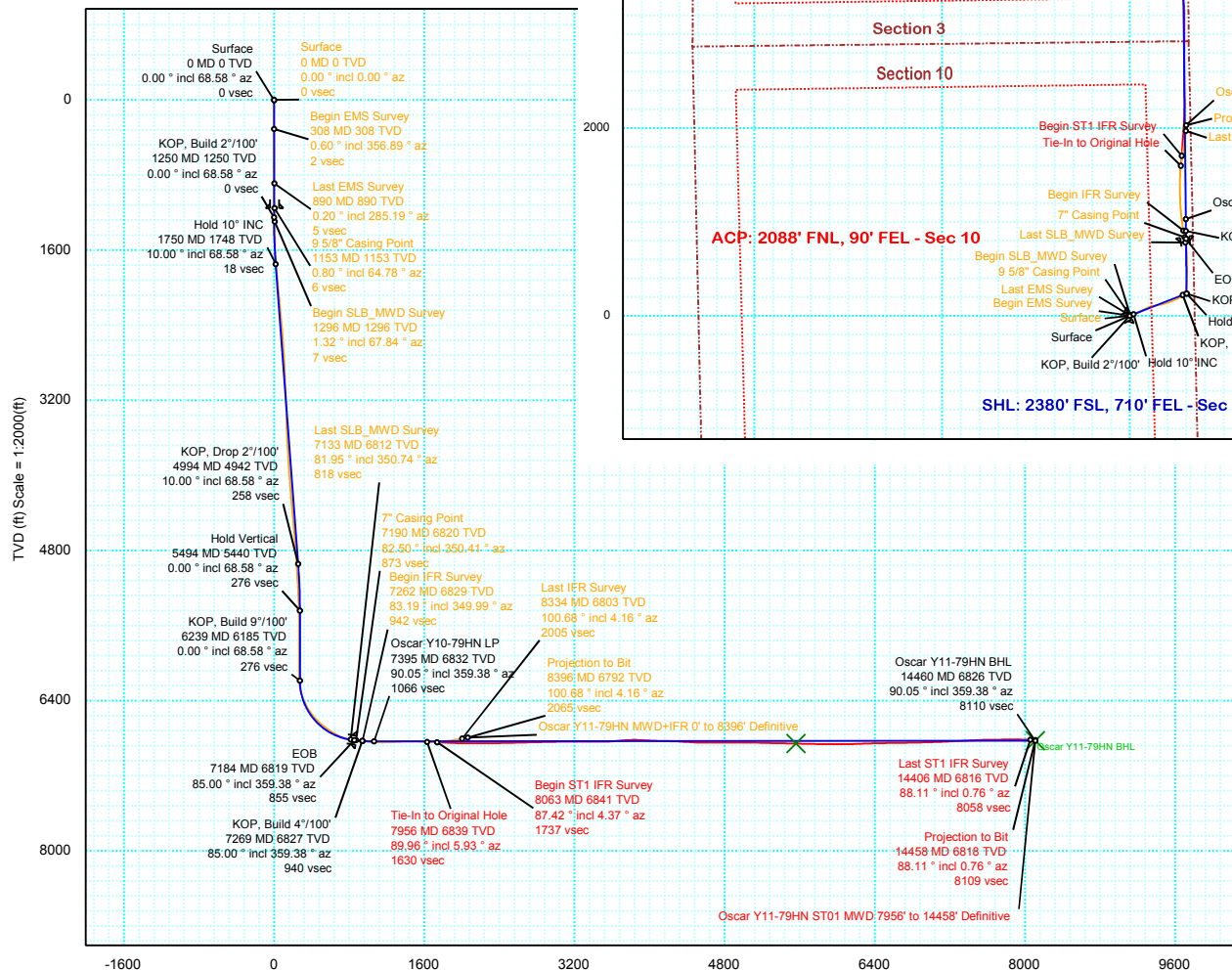
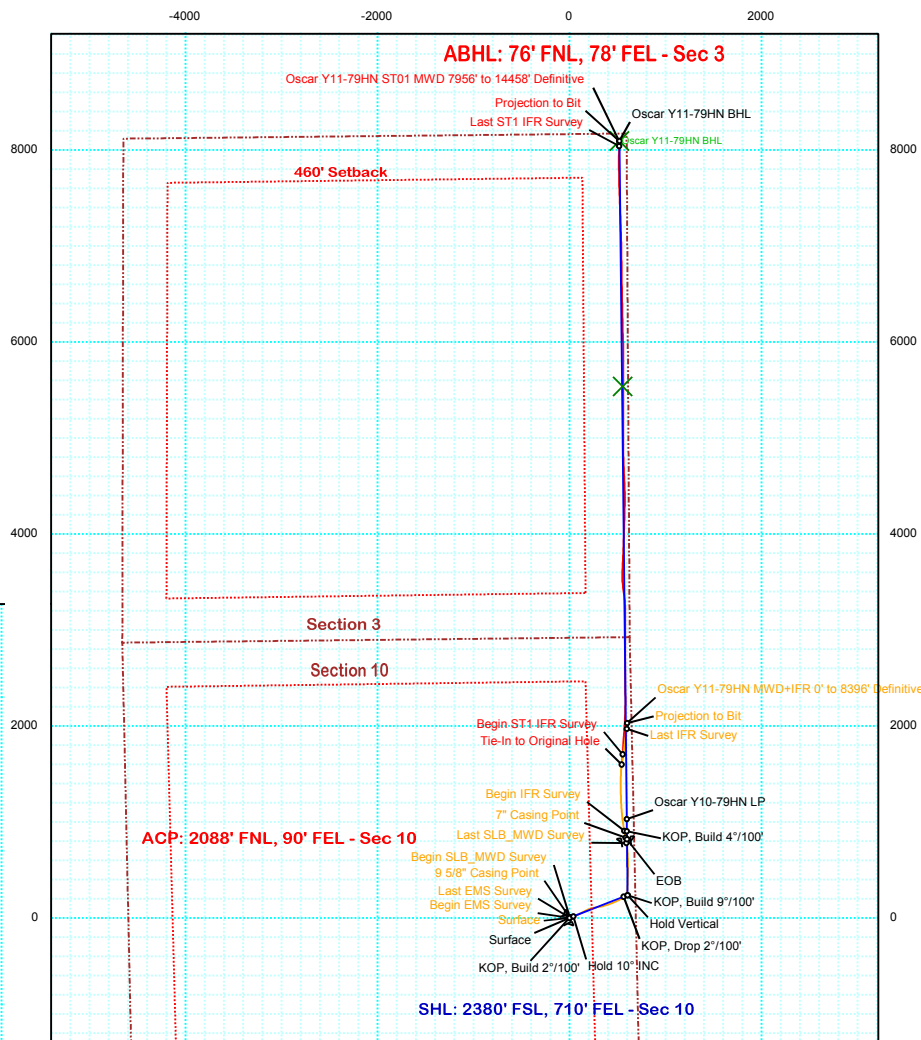
Gravity & Magnetic Parameters	Surface Location	NAD83 Colorado State Plane, Northern Zone, US Feet	Miscellaneous
Model: BGGM 2014 Dip: 66.759° Date: 25-Dec-2014	Lat: N 40 9 7.99 Northing: 1299778.09ftU Grid Conv: 0.6263°	Slot: Oscar Y11-79HN TVD Ref: RKB(4953ft above MSL)	Plan: Oscar Y11-79HN ST01 MWD 7956' to 14458' Definitive
MagDec: 8.345° FS: 52538.057nT Gravity FS: 999.008mgn (9.80665 Based)	Lon: W 104 31 50.30 Easting: S 3270958.13ftU Scale Fact: 0.99995832		

PvA

EW (ft) Scale = 1:2000(ft)



Grid North
Tot Corr (M->G 7.719°)
Mag Dec (8.345°)
Grid Conv (0.626°)



Vertical Section (ft) Azim = 3.682° Scale = 1:2000(ft) Origin = 0N/-S, 0E/-W



Oscar Y11-79HN ST01 MWD 7956' to 14458' Definitive Survey Geodetic Report (Def Survey)



Report Date: January 06, 2015 - 01:20 PM
Client: Noble Energy
Field: CO, Weld County (NAD 83 NZ)
Structure / Slot: Noble 10-02N-64W (Oscar Y10-73HN Pad) - H&P 277 / Oscar Y11-79HN
Well: Oscar Y11-79HN
Borehole: ST01
UWI / API#: Unknown / Unknown
Survey Name: Oscar Y11-79HN ST01 MWD 7956' to 14458' Definitive
Survey Date: December 25, 2014
Tort / AHD / DDI / ERD Ratio: 247.402 ° / 8529.442 ft / 6.648 / 1.243
Coordinate Reference System: NAD83 Colorado State Plane, Northern Zone, US Feet
Location Lat / Long: N 40° 9' 7.99200", W 104° 31' 50.30400"
Location Grid N/E Y/X: N 1299778.094 ftUS, E 3270958.127 ftUS
CRS Grid Convergence Angle: 0.6263 °
Grid Scale Factor: 0.99995832
Version / Patch: 2.8.572.0

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 3.682 ° (Grid North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: RKB
TVD Reference Elevation: 4953.000 ft above MSL
Seabed / Ground Elevation: 4929.000 ft above MSL
Magnetic Declination: 8.345 °
Total Gravity Field Strength: 999.0079mgn (9.80665 Based)
Gravity Model: GARM
Total Magnetic Field Strength: 52538.057 nT
Magnetic Dip Angle: 66.759 °
Declination Date: December 25, 2014
Magnetic Declination Model: BGGM 2014
North Reference: Grid North
Grid Convergence Used: 0.6263 °
Total Corr Mag North->Grid North: 7.7184 °
Local Coord Referenced To: Well Head

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
Tie-In to Original Hole	7956.00	89.96	5.93	6838.56	1630.04	1598.40	543.97	N/A	1301376.43	3271502.07	N 40 9 23.73	W 104 31 43.07
Begin ST1 IFR Survey	8063.00	87.42	4.37	6841.01	1736.96	1704.93	553.57	2.79	1301482.95	3271511.67	N 40 9 24.78	W 104 31 42.93
	8157.00	87.39	4.17	6845.27	1830.86	1798.58	560.56	0.21	1301576.59	3271518.67	N 40 9 25.70	W 104 31 42.83
	8252.00	87.15	4.10	6849.79	1925.75	1893.22	567.41	0.26	1301671.23	3271525.51	N 40 9 26.64	W 104 31 42.73
	8346.00	89.52	3.49	6852.52	2019.70	1986.97	573.62	2.60	1301764.98	3271531.73	N 40 9 27.56	W 104 31 42.64
	8440.00	90.17	2.16	6852.78	2113.69	2080.85	578.26	1.57	1301858.85	3271536.36	N 40 9 28.49	W 104 31 42.56
	8534.00	90.00	2.12	6852.64	2207.66	2174.79	581.77	0.19	1301952.78	3271539.87	N 40 9 29.42	W 104 31 42.51
	8629.00	90.58	359.40	6852.16	2302.52	2269.77	583.03	2.93	1302047.76	3271541.13	N 40 9 30.36	W 104 31 42.48
	8724.00	91.07	359.73	6850.79	2397.27	2364.75	582.31	0.62	1302142.74	3271540.41	N 40 9 31.30	W 104 31 42.47
	8818.00	91.31	359.96	6848.84	2491.04	2458.73	582.05	0.35	1302236.72	3271540.15	N 40 9 32.22	W 104 31 42.46
	8913.00	91.41	0.01	6846.58	2585.81	2553.71	582.03	0.12	1302331.69	3271540.13	N 40 9 33.16	W 104 31 42.45
	9006.00	91.41	0.15	6844.29	2678.60	2646.68	582.16	0.15	1302424.66	3271540.26	N 40 9 34.08	W 104 31 42.43
	9101.00	91.44	0.10	6841.93	2773.39	2741.65	582.36	0.06	1302519.62	3271540.46	N 40 9 35.02	W 104 31 42.42
	9196.00	91.20	359.66	6839.74	2868.15	2836.62	582.16	0.53	1302614.59	3271540.27	N 40 9 35.96	W 104 31 42.41
	9290.00	91.17	359.60	6837.80	2961.90	2930.60	581.56	0.07	1302708.57	3271539.66	N 40 9 36.89	W 104 31 42.40
	9383.00	91.72	0.36	6835.45	3054.67	3023.57	581.52	1.01	1302801.53	3271539.63	N 40 9 37.81	W 104 31 42.39
	9477.00	89.62	359.54	6834.35	3148.46	3117.56	581.44	2.40	1302895.52	3271539.54	N 40 9 38.74	W 104 31 42.38
	9571.00	89.79	359.14	6834.84	3242.19	3211.55	580.36	0.46	1302989.50	3271538.46	N 40 9 39.66	W 104 31 42.38
	9664.00	89.86	355.56	6835.12	3334.61	3304.43	576.06	3.85	1303082.38	3271534.16	N 40 9 40.58	W 104 31 42.42
	9758.00	89.66	351.60	6835.52	3427.13	3397.83	565.55	4.22	1303175.77	3271523.65	N 40 9 41.51	W 104 31 42.54
	9852.00	90.03	353.67	6835.77	3519.38	3491.04	553.50	2.24	1303268.99	3271511.61	N 40 9 42.43	W 104 31 42.68
	9947.00	95.41	2.80	6831.25	3613.71	3585.76	550.57	11.14	1303363.69	3271508.67	N 40 9 43.36	W 104 31 42.71
	10042.00	94.92	2.63	6822.70	3708.31	3680.26	555.05	0.55	1303458.20	3271513.15	N 40 9 44.30	W 104 31 42.64
	10136.00	91.93	2.42	6817.09	3802.11	3773.99	559.18	3.19	1303551.92	3271517.28	N 40 9 45.22	W 104 31 42.57
	10231.00	87.01	2.00	6817.97	3897.05	3868.89	562.84	5.20	1303646.82	3271520.95	N 40 9 46.16	W 104 31 42.51
	10326.00	86.63	2.35	6823.24	3991.87	3963.68	566.44	0.54	1303741.60	3271524.55	N 40 9 47.10	W 104 31 42.45
	10420.00	88.42	1.68	6827.29	4085.74	4057.53	569.75	2.03	1303835.44	3271527.85	N 40 9 48.02	W 104 31 42.39
	10515.00	88.87	2.65	6829.54	4180.68	4152.43	573.33	1.13	1303930.34	3271531.44	N 40 9 48.96	W 104 31 42.33
	10609.00	87.87	0.21	6832.21	4274.56	4246.35	575.68	2.80	1304024.26	3271533.78	N 40 9 49.89	W 104 31 42.29
	10704.00	86.22	1.02	6837.11	4369.29	4341.22	576.70	1.93	1304119.12	3271534.80	N 40 9 50.83	W 104 31 42.27
	10799.00	87.21	358.55	6842.56	4463.91	4436.05	576.34	2.80	1304213.95	3271534.44	N 40 9 51.76	W 104 31 42.26
	10893.00	88.80	357.11	6845.83	4557.36	4529.92	572.78	2.28	1304307.82	3271530.88	N 40 9 52.69	W 104 31 42.29
	10988.00	90.41	357.82	6846.48	4651.79	4624.82	568.58	1.85	1304402.72	3271526.68	N 40 9 53.63	W 104 31 42.33
	11082.00	89.86	357.84	6846.26	4745.30	4718.76	565.02	0.59	1304496.64	3271523.12	N 40 9 54.56	W 104 31 42.36
	11177.00	90.28	359.20	6846.15	4839.91	4813.72	562.57	1.50	1304591.61	3271520.67	N 40 9 55.50	W 104 31 42.38
	11271.00	90.00	358.98	6845.92	4933.61	4907.71	561.08	0.38	1304685.59	3271519.18	N 40 9 56.43	W 104 31 42.39
	11366.00	90.76	0.30	6845.29	5028.37	5002.70	560.48	1.60	1304780.58	3271518.58	N 40 9 57.37	W 104 31 42.38
	11461.00	88.32	359.86	6846.05	5123.17	5097.69	560.61	2.61	1304875.56	3271518.71	N 40 9 58.30	W 104 31 42.37
	11555.00	88.66	0.15	6848.53	5216.94	5191.66	560.62	0.48	1304969.53	3271518.72	N 40 9 59.23	W 104 31 42.35
	11650.00	88.87	0.11	6850.57	5311.74	5286.64	560.83	0.23	1305064.50	3271518.94	N 40 10 0.17	W 104 31 42.34
	11745.00	88.49	359.71	6852.76	5406.51	5381.61	560.69	0.58	1305159.47	3271518.79	N 40 10 1.11	W 104 31 42.32
	11839.00	89.17	0.14	6854.68	5500.29	5475.59	560.56	0.86	1305253.45	3271518.66	N 40 10 2.04	W 104 31 42.31
	11934.00	88.86	0.22	6856.31	5595.10	5570.58	560.86	0.34	1305348.43	3271518.96	N 40 10 2.98	W 104 31 42.30
	12029.00	88.62	0.59	6858.40	5689.92	5665.55	561.53	0.46	1305443.40	3271519.63	N 40 10 3.92	W 104 31 42.27
	12124.00	87.70	0.20	6861.45	5784.71	5760.50	562.19	1.05	1305538.34	3271520.29	N 40 10 4.85	W 104 31 42.25
	12218.00	89.97	359.67	6863.37	5878.48	5854.47	562.08	2.48	1305632.31	3271520.18	N 40 10 5.78	W 104 31 42.24
	12313.00	91.00	358.43	6862.56	5973.17	5949.45	560.51	1.70	1305727.29	3271518.61	N 40 10 6.72	W 104 31 42.25
	12407.00	90.38	358.14	6861.43	6066.74	6043.40	557.69	0.73	1305821.23	3271515.79	N 40 10 7.65	W 104 31 42.27
	12502.00	90.89	358.68	6860.38	6161.33	6138.36	555.06	0.78	1305916.19	3271513.16	N 40 10 8.59	W 104 31 42.29
	12597.00	92.03	358.75	6857.96	6255.95	6233.30	552.93	1.20	1306011.13	3271511.03	N 40 10 9.53	W 104 31 42.30
	12692.00	92.27	359.06	6854.39	6350.55	6328.22	551.11	0.41	1306106.04	3271509.21	N 40 10 10.46	W 104 31 42.31
	12787.00	91.13	358.67	6851.57	6445.17	6423.16	549.23	1.27	1306200.97	3271507.33	N 40 10 11.40	W 104 31 42.32
	12881.00	90.89	359.06	6849.92	6538.82	6517.12	547.37	0.49	1306294.93	3271505.47	N 40 10 12.33	W 104 31 42.34
	12976.00	90.89	358.92	6848.44	6633.49	6612.10	545.70	0.15	1306389.90	3271503.80	N 40 10 13.27	W 104 31 42.34
	13071.00	90.76	359.30	6847.07	6728.18	6707.08	544.22	0.42	1306484.88	3271502.32	N 40 10 14.21	W 104 31 42.35
	13165.00	91.31	359.44	6845.38	6821.90	6801.05	543.19	0.60	1306578.85	3271501.29	N 40 10 15.14	W 104 31 42.35
	13260.00	91.41	359.08	6843.12	6916.59	6896.02	541.96	0.39	1306673.81	3271500.06	N 40 10 16.08	W 104 31 42.35
	13354.00	91.96	359.27	6840.36	7010.26	6989.97	540.61	0.62	1306767.76	3271498.71	N 40 10 17.00	W 104 31 42.36
	13449.00	91.75	357.87	6837.28	7104.83	7084.89	538.24	1.49	1306862.67	3271496.34	N 40 10 17.94	W 104 31 42.37
	13544.00	92.85	357.24	6833.47	7199.21	7179.72	534.19	1.33	1306957.50	3271492.29	N 40 10 18.88	W 104 31 42.41
	13638.00	93.09	358.28	6828.60	7292.58	7273.52	530.52	1.13	1307051.30	3271488.62	N 40 10 19.81	W 104 31 42.45
	13733.00	92.41	358.52	6824.04	7387.07	7368.38	527.87	0.76	1307146.15	3271485.97	N 40 10 20.75	W 104 31 42.47
	13828.00	93.27	357.55	6819.33	7481.49	7463.20	524.62	1.36	1307240.97	3271482.72	N 40 10 21.68	W 104 31 42.50
	13923.00	91.00	358.14	6815.79	7575.92	7558.06	521.05	2.47	1307335.83	3271479.15	N 40 10 22.62	W 104 31 42.53
	14018.00	90.52	358.82	6814.53	7670.52	7653.02	518.53	0.88	1307430.78	3271476.63	N 40 10 23.56	W 104 31 42.55
	14112.00	91.34	358.82	6813.01	7764.17	7746.99	516.59	0.87	1307524.74	3271474.70	N 40 10 24.49	W 104 31 42.56
	14207.00	89.93	359.40	6811.96	7858.86	7841.97	515.12	1.60	1307619.72	3271473.22	N 40 10 25.43	W 104 31 42.56
	14302.00	88.69	1.12	6813.10	7953.68	7936.95	515.55	2.23	1307714.70	3271473.65	N 40 10 26.36	W 104 31 42.55
Last ST1 IFR Survey	14406.00	88.11	0.76	6816.00	8057.52	8040.90	517.25	0.66	1307818.64	3271475.36	N 40 10 27.39	W 104 31 42.51
Projection to Bit	14458.00	88.11	0.76	6817.72	8109.42	8092.86	517					

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
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Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma
Survey Program:

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
Surface	1	0.000	890.000	Act Stns	13.750	9.625	SLB_EMS-STD-Depth Only	Original Hole / Oscar Y11-79HN
Intermediate	1	890.000	7133.000	1/98.425	8.750	7.000	SLB_MWD-STD	MWD+IFR 0' to 8396' Definitive
* Lateral	1	7133.000	7956.000	Act Stns	6.125	4.500	SLB_MWD+IFR1+MS	Original Hole / Oscar Y11-79HN
* Lateral	1	7956.000	14406.000	Act Stns	6.125	4.500	SLB_MWD+IFR1+MS	MWD+IFR 0' to 8396' Definitive
Bit Projection	1	14406.000	14458.000	Act Stns	6.125	4.500	SLB_BLIND+TREND	ST01 / Oscar Y11-79HN ST01
								MWD 7956' to 14458' Definitive
								MWD 7956' to 14458' Definitive

* SLB_MWD+IFR+MS =
MWD+IFR1+MS_WY